CLAIMS

What is claimed is:

1. A fuel cell stack antifreeze system that purges a plurality of fuel cell stacks connected in parallel, comprising:

a compressor that supplies pressurized cathode gas to each of said plurality of fuel cell stacks; and

a controller that deactivates a first group of one or more of said plurality of fuel cell stacks and maintains operation of a second group of one or more of said plurality of fuel cell stacks, wherein said second group powers said compressor and said compressor purges excess fluid from said first group using said pressurized cathode gas.

2. The fuel cell stack antifreeze system of claim 1 wherein said controller deactivates said second group after purging said excess fluid from said first group.

3. The fuel cell stack antifreeze system of claim 2 wherein said controller activates said first group, wherein said first group is used to heat said second group.

4. The fuel cell stack antifreeze system of claim 3 further comprising a coolant system that circulates a heat transfer fluid through said plurality of fuel

cell stacks, wherein waste heat from said first group is transferred via said heat transfer fluid to said second group.

5. The fuel cell stack antifreeze system of claim 3 further comprising a heating system including an electrical heater associated with each of said plurality of fuel cell stacks, wherein said first group powers said electrical heater that heats said second group.

6. The fuel cell stack antifreeze system of claim 1 further comprising an operator input that selectively generates a shutdown signal, wherein said controller deactivates said first group in response to said shutdown signal.

7. The fuel cell stack antifreeze system of claim 1 further comprising an operator input that selectively generates a reduced load demand, wherein said controller deactivates said first group in response to said reduced load demand.

8. The fuel cell stack antifreeze system of claim 7 wherein a number of fuel cell stacks in said first group is based on a number of fuel cell stacks required to provide said reduced power demand.

9. A method of controlling a fuel cell system having a plurality of fuel cell stacks connected in parallel, comprising:

deactivating a first group of one or more of said plurality of fuel cell stacks;

maintaining operation of a second group of one or more of said plurality of fuel cell stacks;

powering a cathode supply system using said second group; and

purging excess fluid from said first group using pressurized cathode gas supplied from said cathode supply system.

10. The method of claim 9 further comprising deactivating said second group after purging said excess fluid from said first group.

11. The method of claim 10 further comprising:

activating said first group; and

heating said second group using said first group.

12. The method of claim 11 wherein said step of heating comprises transferring waste heat from said first group to said second group.

13. The method of claim 11 wherein said step of heating comprises powering a heater that heats said second group using power generated by said first group.

14. The method of claim 9 further comprising detecting a shutdown event, wherein said step of deactivating said first group occurs in response to said shutdown event.

15. The method of claim 9 further comprising detecting a reduced load demand, wherein said step of deactivating said first group occurs in response to said reduced load demand.

16. The method of claim 15 wherein a number of fuel cell stacks of said first group is based on a number of fuel cell stacks required to provide said reduced power demand.

17. A fuel cell system, comprising:

a plurality of fuel cell stacks connected in parallel;

an input device that generates one of a shutdown signal and a load demand signal;

a compressor that supplies pressurized cathode gas to each of said plurality of fuel cell stacks; and

a controller that deactivates a first group of one or more of said plurality of fuel cell stacks and that maintains operation of a second group of one or more of said plurality of fuel cell stacks based on said one of said shutdown signal and said load demand signal, wherein said second group powers said compressor and said compressor purges excess fluid from said first group using said pressurized cathode gas.

18. The fuel cell system of claim 17 wherein said controller deactivates said second group after purging said excess fluid from said first group.

19. The fuel cell system of claim 18 wherein said controller activates said first group in response to a start-up signal generated by said input device, wherein said first group is used to heat said second group.

20. The fuel cell system of claim 19 further comprising a coolant system that circulates a heat transfer fluid through said plurality of fuel cell stacks, wherein

waste heat from said first group is transferred via said heat transfer fluid to said second group.

21. The fuel cell system of claim 19 further comprising a heating system including an electrical heater associated with each of said plurality of fuel cell stacks, wherein said first group powers said electrical heater that heats said second group.

22. The fuel cell system of claim 17 wherein a number of fuel cell stacks of said first group is based on a number of fuel cell stacks required to provide said load command.